

formed, an adults' Natural History Club is started, then a childrens' Natural History Club. Simplicity is the key-note of our Nature teaching, because we find life so simple.

Human Nature is taught in all sorts of aspects and connections in history and in literature, and this teaching is given, not through cut and dried text books from which every atom of life has been crushed, but wherever that is possible straight from the very source. Children drink in knowledge eagerly and with absolute delight. God has so made us that we should love knowledge, but all knowledge must be living knowledge.

Human nature must be studied in other forms, in architecture ancient and modern, in Art, in the development of creation in all points, until we arrive at the mind of man. Languages, classical and modern, are studied to give new ideas of the workings of human nature.

War has been waged lately between what is called secular and what is called religious education. We do not divide education into secular and religious in the ordinary acceptation of the terms, but rather into secular and sacred—all dead education is secular, all education in which are living thoughts and ideas is sacred. "I willed and sense was given unto me, I prayed and the spirit of wisdom came upon me." The same idea is expressed in the fresco of the Spanish Chapel—that all living knowledge does and must come from the one great Intellect of the universe.

We are a little in the attitude of Florence, who said, "I willed and I prayed." We too believe that every bit of living teaching in our schoolrooms is actually under the guidance of the Holy Spirit, and that all the new ideas which we receive are gifts from above. As Coleridge puts it, certain minds are chosen, and are specially fitted to be the channels through which higher and fuller revelation is vouchsafed to us, and this applies to all forms of knowledge, not only to that which is generally called religious.

The P.N.E.U. is a society worthy of great efforts; it is a centre of living thought, and each branch is a focus of the best and highest thoughts of the district in which it is formed, and it must shed its influence around it, even upon those who are not members. Those who are members owe certain duties to the Society—each individual ought to work with exceeding vigour in the propagation of the work of the Society; they should try and influence their immediate neighbours and write to their friends at a distance. The excuse which is so often given that the people near are not the sort of people to be interested in the subject of education is no valid

excuse at all, in fact it is rather a conceited thing to say, and simply means that we ourselves are so much more capable of enthusiasm and high thoughts than our neighbours are.

The Editor is sorry to have given such a poor and imperfect account of what was a most inspiring speech, but as she knows words from Miss Mason are always helpful, she has done her best to pass on to others as much as she can remember, and she only hopes she has followed the right train of thought, and given the spirit if not the words.

NATURAL HISTORY.

AN EXCURSION TO HUMPHREY HEAD.

MANY of you will remember a delightful outing we once had to Furness Abbey. We have recently had a similar excursion to a delightful place in Morecambe Bay, where we had a very festive time indeed on the sea shore. We started early in the morning by steamer down the lake. I am quite sure that no one needs telling how pleasant that was, it is so nice to begin and end a day out on Windermere, as we all know. We reached our destination about eleven o'clock, and as we had not to leave until nearly five, we had plenty of time before us. Having arranged about tea at a very convenient hotel, the station-master kindly took us through a very interesting railway cutting (where we found ever so many new flowers) to the sands. On a bank by the railway we found two Rock Roses and Tufted Horse-shoe Vetch. Close by, on the sands, we found Thrift in abundance. You will guess how many delighted exclamations were heard on all sides as one new thing after another was discovered. Skirting the rocks by the edge of the sands, or walking straight across, we soon found ourselves on the great bold headland of limestone that we were bound for; for nearly a mile and a half it juts out into the sea, running almost directly north and south, and being nowhere more than a quarter of a mile in width. On the side we first approached we found a delightful wood, full of lovely flowers; some we had seen before in the woods by Windermere, but others were found here out in

flower for the first time this year. The little black note-books so well known to you all were in great requisition. I have put our list of plants at the end of my letter, so that you may see what we got. As we went along the shore we found a great many characteristic limestone fossils; some members of our party spent a great deal of time in hammering them out. Through the kindness of the father of one of our present students, we had made out the geology of this part of the coast before we came, by means of some good geological maps he kindly sent us. It was really refreshing to see the bright red sandstone soil once more as it crops out on the west side of the headland. We soon broke up into small parties, the less energetic being content to sit about in the shade on the shore, while the more active members soon scattered far and wide in search of what they could get of any and every kind of treasure. Part of the delight of Humphrey Head is its being so far away from everywhere and everybody. Not a soul or even a house could be seen. Sheep excepted, we seemed to be the only living creatures for miles. The smooth sands and warm water soon tempted of many shoes and stockings, and what at first we took for a party of shrimpers turned out to be some very sedate members of our party, wading about on the shore far below us. We could not get down to them, as on the west side the headland is very precipitous and well nigh inaccessible, though two students somehow managed to scramble up. I can scarcely tell you how much everybody seemed to enjoy the fresh breeze and lovely sea air, it was most invigorating. It was very interesting to get a glimpse once more of the sea-shore plants in their native place. Sea Campions, Plantains, Thrift, Sea Milkwort, etc., all looked so delightfully new, and yet had such well-known faces, I could scarcely contain my pleasure at the sight of them. After some hours we began to wend our way tea-wards, and were not sorry to get tidied up and refreshed before we sat down to cups of good tea and nice bread and butter. We were all terribly thirsty, and went on drinking tea until we could get no more hot water and had finished the milk. A gay string band came and played for us, which gave our proceedings a very festive air; after tea we sat out in the hotel garden until our train was due, that had to be specially stopped for us, which made us feel very grand indeed. I let someone carry my lunch for me, and found myself at dinner-time with nothing to eat, and so had to beg for scraps all round. One misguided person fell into the sea, and another lost her hat for some hours, but beyond this nothing happened, and it was a not very tired and a very happy party that landed from the 6-30 steamer after a most enjoyable time at Humphrey Head.

LIST OF PLANTS FOUND AT HUMPHREY HEAD BY M. R. NEILD,
MAY 13TH, 1896.

Sea Pink, *Armeria maritima*.
 Rock Rose, *Helianthemum vulgare*.
 Greater Bird's Foot Trefoil, *Lotus major*.
 Lesser Bird's Foot Trefoil, *Hippocrepis comosa*.
 Lesser Rock Rose, *H. guttatum*.
 Silverweed, *Potentilla anserina*.
 Mouse-ear Hawkweed, *Hieracium pilosella*.
 Crosswort, *Galium cruciatum*.
 Herb Robert, *Geranium Robertianum*.
 Hawthorn, *Crataegus oxyacantha*.
 Cowslip, *Primula veris*.
 Gooseberry, *Ribes Grossularia*.
 Stitchwort, *Stellaria holostea*.
 Tormentil, *Potentilla tormentilla*.
 Twagblade, *Listera ovata*.
 Forget-me-not, *Myosotis arvensis*.
 Danish Scurvy Grass, *Cochlearia danica*.
 Sea Campion, *Silene maritima*.
 Sea Arrowgrass, *Triglochin maritimum*.
 Great Horsetail, *Equisetum maximum*.
 Marsh Horsetail, *Equisetum palustre*.
 Buckshorn Plantain, *Plantago coronopus*.
 Ribwort Plantain, *P. lanceolata*.
 Sea Plantain, *P. maritima*.
 Wood Sedge, *Carex sylvatica*.
 Sea Milkwort, *Glaux maritima*.
 Common Milkwort, *Polygala vulgaris*.
 Pea Vetchling, *Vicia orobas*.
 Bush Vetch, *V. sepium*.
 Field Madder, *Sherardia arvensis*.
 Hop Trefoil, *Trifolium procumbens*.
 White Clover, *T. repens*.
 Slender Flowered Thistle, *Carduus tenuiflorus*.
 Bird's Nest Orchis, *Listera nidus-avis*.

M. S. H.

A FRESH-WATER AQUARIUM.

A REALLY nice aquarium is a very interesting and instructive thing to have, but it needs attention, and is not to be obtained without a little trouble and sometimes vexation, but as the old proverb goes, "If at first you don't succeed, try, try, try again," so I think your efforts will be rewarded in the end.

It is better to have a good large tank so that you can have room for plenty of creatures, one about two feet long and one foot broad and high, made of glass, with a slate bottom, would answer the purpose very well.

The first thing to get is some nice fine gravel and stones for the floor; wash these free from all soil and impurities, and place on the floor of the tank to the depth of two to four inches; large stones may also be used to keep down the roots of water-weeds, which will be necessary to help to keep the water fresh and clear.

Almost every aquatic plant can be grown in the still water of an aquarium, and be more or less useful; some may be put in for their beauty, others for their use.

The common water crowfoot looks very beautiful in the aquarium, with its large, handsome, white flowers and floating leaves, but for both beauty and utility the Italian water-weed (*Callistegia spiralis*) is a great favourite, and is one of the best of all water-weeds for producing oxygen.

Duckweed is also very useful in an aquarium for keeping the water shaded on the surface, but only a very little should be placed in the tank at a time, as it multiplies so rapidly.

Nitella translucens is a good weed for the aquarium, and succeeds best when a small portion of the plant is sunk, by the help of a stone, to the bottom. It grows in ponds and ditches where the water is clear.

There are many other kinds of weeds which are suitable for the aquarium, and most of them will grow if sunk to the bottom with a stone. I have tried planting them in pots, but I found the earth made the water very difficult to keep clean.

When all the plants have been put in their places, the water should then be added, that from a river or a clear pond being the best kind of water; pour in the water gently from a watering can with a rose.

When the plants have grown, and the water is still clear and clean, it is all ready for the admittance of animal life.

In almost every stagnant pond you will be sure to find abundance of life of all sorts. Take a small net and sweep it through the water, and you will probably find water snails, shrimps, newts, tadpoles, caddis worms, etc., etc.

Newts are very interesting creatures for the aquarium, and take very readily to a life of confinement. If you introduce tadpoles where there are newts you will very probably soon see no more tadpoles, as the newts are very fond of preying on small animals of that sort. They will also eat worms and pieces of raw or cooked meat, which, however, must not be left in the water to go bad, as it pollutes the whole atmosphere very soon.

Small fishes are very desirable for the aquarium, if it be of a moderate size, and no fish is more beautiful and pleasing than the little stickleback, though if you admit him you must not have any other kind of fish. Sticklebacks may be caught in most of the ponds and ditches and slow-running streams of this country.

In the net you will probably see some very ugly and uninviting looking creatures, namely, the larvae of the dragon fly. These creatures are very greedy, and live by preying upon their weaker companions, in fact, if food is scarce, they will even eat one another. As the larva of the dragon fly grows it changes its skin frequently, and sometimes makes you think you have two larvae where one was before.

After the changes of skin are completed, the wing cases begin to appear, and then the creature passes into the pupa state, then it will gradually crawl up a piece of stick or stem of an aquatic plant above the water, and wait there for its final change. In due time the skin splits, and the dragon fly slowly emerges from the pupa case, and after a time the wings expand, grow stronger, and the perfect dragon fly floats away to enjoy its more glorious life in the sunshine. I have sometimes seen the pupa case left on the stem of a plant, and thought it contained the dragon fly, but after carefully transferring it to my net, and fearing it might jump off into the water, I found it offered no resistance, and on examination I saw it was only the empty pupa case deserted by its late occupant.

These larvae cannot be kept in an aquarium with other creatures or they would soon devour everything before them. Put them into a glass by itself and you will find them very interesting indeed.

We all know the little caddis worm which builds for itself a house in which it is secure from the attacks of its numerous enemies. These cases which contain the worm may be found either in

stagnant or running water. I have often found them amongst the fine shingle of a river bed. These creatures will live for a long time in the aquarium without eating anything at all, but they sometimes eat up choice weeds and do a great deal of harm, so that they are really best in small aquaria, where one can see them easily and provide weeds on purpose as required.

Water snails are very useful as general scavengers, and keep the sides of the glass clear and clean.

Fresh water shrimps are useful for the same purpose, and may be found in clear streams, especially where the watercress abounds.

The water spider is a great favourite in the tank, if one is fortunate enough to catch one, but they can always be bought in London at prices from threepence to one shilling each.

The great water beetle is a very desirable inmate for the aquarium, only that he is so destructive in eating up small fish, young newts, small frogs, tadpoles, snails, and other worms, insects and larvae. A good plan, however, is to feed these beetles in a separate vessel, and when they have eaten enough return them to the aquarium. They need thus only to be fed twice a week, and the aquarium will be kept sweet and clear.

In a properly arranged aquarium the water should seldom or never need changing, but as it is difficult (especially for beginners) to keep animal and vegetable life equally balanced, and also that a piece of meat or other matter might get left in by mistake and make all the water unhealthy, it is often necessary to change the water every three months. This can easily be done by means of a piece of india-rubber tubing used as a syphon, but the fish and other inhabitants should first be removed from the tank.

Do not place the aquarium in too much sunshine, as the higher the temperature of the water the fewer animals will it be able to contain.

S. SMYTH.

OUR NEWT POND.

It was quite by accident that we found the pond. When first my children saw the newts all swimming on the water, they cried out, "Look at the young crocodiles." "No, alligators," cried another.

We watched them for a long time, but could not catch any. It was some time before I could get the children away from the pond, and it was not until I had promised to come again the next day and bring the nets that I succeeded.

We all went armed with nets and jars and caught several males and females. The "he's" were the favourites, on account of their beautiful orange breasts, and the crest they had on their backs.

We brought some home, also cyclops, water boatmen, caddis worms, water snails, in all of which my children were greatly interested.

We all watched them a great deal, and one day the male newt had some green jelly very near it, and one of the children called out, "Come, oh do come, the *he* newt has laid an egg."

We now go to the pond every week to get fresh supplies, and we brought a dragon fly larva back, but we could not keep it, as it would simply have eaten up everything, so we had to let it go.

One day we brought home about twenty tadpoles, and put them in the jar; the next morning, to our surprise, not a single tadpole was to be seen; the newts had eaten them all. We gave the newts raw meat, and they loved it.

BABY, LOVER OF NATURE.

ONE day last summer, Baby, aged two, was in the garden playing with two little kittens. All at once she came up with her little first finger and thumb round one of the kitten's necks to a tub full of water and said, "Baby going to give kittens a bath." We just stopped her in time. She herself loves her bath, and so thought the kitten would.

The other day she came to me with her fat little hands full of worms and said, "Baby has brought you a lovely present; here is a lovely worm" (picking out the biggest). When I said, "Oh, Baby!" she said, "Don't you love them?"

ISABEL GILBERT.

APRIL PLANTS.

(See Letter from the House of Education Students).

April.

- 7 Blackthorn.
- Bilberry.
- Maple.
- 8 Water Crowfoot.
- 9 Marsh Marigold.
- 10 Wild Hyacinth.
- Wild Cherry.
- 13 Cuckoo Flower.
- 15 Broom.
- 16 Melic Grass.
- 17 Gooseberry.
- Ground Ivy.
- Stitchwort.
- American Medlar.
- Lady's Mantle.
- Red Campion.
- Goldilocks.
- 18 Welsh Poppy.
- 20 Wild Plum.
- Marsh Violet.
- Purple Orchis.
- Garlic.
- White Violet.
- Sweet Sicily.
- 21 Tuberosus Bitter Vetch.
- Herb Paris.
- Sycamore.
- 22 Jack by the Hedge.
- Birch.
- Water Avens.
- Forget-me-not.
- Wintercress.
- Cow Parsley.
- 23 Ribwort Plantain.
- 24 Woodruff.
- Dock.
- Sweet Vernal Grass.
- Hairy Bittercress.

April.

- 24 Sheep's Parsley.
- Milkwort.
- 26 Ash.
- Oak.
- Hop Trefoil.
- Speedwell.
- Bird Cherry.
- 27 Cowslip.
- Common Fennel.
- Hogweed.
- Potentilla Tormentilla.
- Ivy-leaved Toadflax.
- Cotton Grass.
- Soft Cranesbill.
- Good King Hal.
- Teesdalia.
- Horsetail.
- Climbing Conydis.
- Wild Currant.
- 28 Pansy.
- 29 Globe Flower.
- Spearwort.
- Carea Precoa.
- Blue Wood Violet.
- Plane.
- Meadow Grass.
- Soft Brome Grass.
- Lesser Speedwell.
- Rest Harrow.
- Glancous Carea.
- 30 Turnip.
- Lousewort.
- Shining Cranesbill.
- Bog Starwort.
- Meadow Pontail.
- Yellow Vetch.
- Wood Cranesbill.
- Valerian.

THE P.N.E.U. CONVERSAZIONE.

So few of the members of our Association were present at the *Conversazione* on June 11th, that perhaps a short account of that gathering will be of interest to many of the readers of our Magazine.

The *Conversazione* was held in the Portman Rooms, Baker Street; about 300 P.N.E.U. members and friends were present. The first part of the evening was devoted to speeches, and to the presentation of certificates to the ex-students of the House of Education, the latter part to conversation, and to the inspection of Natural History diaries and specimens of the handiwork of the House of Education students and children of the P.R.S.

The Earl of Meath, who had promised to take the chair, was unavoidably absent, and his place was filled by Dr. Schofield.

The Chairman, in his opening address, spoke of the growing need for such a union as the P.N.E.U., and of the splendid work which it is doing in the various fields which it covers, and he showed how it is growing and developing in all directions. He gave some valuable hints as to the formation of new branches, which may be of use to some of the isolated students. A healthy branch cannot be founded upon any imported enthusiasm, but must be the result of local effort and local wish. An enthusiastic outside speaker may for a time excite great interest in the work of the Union, and a branch may be formed, but unless this is supplemented by real deep-seated interest in the members of the new branch no lasting good will have been effected, and the branch must necessarily wither away. The best way to set to work is for scattered members or readers of the P.R. to get others interested in the *Review*; for these to meet together and talk over the thoughts which they find given, and then to form a branch. At this stage enthusiasm from outside will do a great deal in fanning into a steady flame the embers which are already smouldering.

Miss Mason was the next speaker. A short report of her speech will be found in another part of the Magazine.

Mrs. Francis Steintal was next called upon. She had, she said, intended speaking upon the work of the Society, but found herself